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FOUNDATION INVESTIGATION REPORT
PROPOSED LAYDOWN AREA FOR BRIDGE CONSTRUCTION HIGHWAY 401 AND PARK ROAD SOUTH CITY OF OSHAWA, ONTARIO
G.W.P. 2555-17-00
GEOCRES No. 30M15-370

Client Name: Egis Canada Ltd.
Date: March 12, 2025
File: 30915

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THURBER

FOUNDATION INVESTIGATION REPORT
PROPOSED LAYDOWN AREA
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PART 1: FACTUAL INFORMATION

1. INTRODUCTION

This report presents the factual findings obtained from a foundation investigation carried out by Thurber Engineering Ltd. (Thurber) for a proposed location to be used as a laydown area for bridge construction operations and other related works associated with the Highway 401 Park Road South and Cubert Street bridge replacements and highway widening in the City of Oshawa, Ontario. The laydown area may otherwise be known as the construction staging area for Rapid Bridge Replacement (RBR).

The purpose of this investigation was to explore the subsurface conditions at the proposed laydown area, and based on the data obtained, to provide borehole location and soil strata drawing, records of boreholes, laboratory test results, and a written description of the subsurface conditions. A model of the subsurface conditions was developed for the site, based on data obtained from the present investigation, to describe the geotechnical conditions influencing the temporary works to be carried out within the laydown area.

Thurber was retained by Egis Canada Ltd. (Egis) to carry out this investigation under the Ministry of Transportation Ontario (MTO) Agreement Number 2019-E-0076. The overall assignment includes replacement of the Highway 401 at Park Road South and Cubert Street overpass structures, new and proposed retaining walls and noise barrier walls on both sides of the highway, and overhead signs.

It is a condition of this report that Thurber's performance of its professional services is subject to the attached Statement of Limitations and Conditions.

2. SITE DESCRIPTION

The proposed laydown area will be located at the southwest quadrant of the existing Highway 401 at Park Road South overpass structure. Park Road South is approximately 600 m east of Stevenson Road in the City of Oshawa, Ontario. Park Road South generally runs in a north-south direction and carries two lanes of traffic in each direction under Highway 401.

The site is covered with grass and a few trees. The overall surface topography in the vicinity of the site is relatively flat with the ground surface gently sloping towards the south. Beyond the highway right-of-way, the lands are currently occupied by commercial developments.

Based on published geological information, the site area is located within the Iroquois Plain physiographic region. This region extends around the western shores of Lake Ontario and consists of lakebed and beaches of the former glacial Lake Iroquois. The subsoils in this area are typically comprised of glacial tills and glaciolacustrine clays, silts and sands. Limestone bedrock underlies the soil deposits.

3. SITE INVESTIGATION AND FIELD TESTING

The site investigation and field testing program completed for the laydown area were carried out on October 24 and 25, 2024 and consisted of drilling and sampling four (4) boreholes, designated as Boreholes 24-01 to 24-04. The boreholes were positioned at selected locations across the site to provide adequate coverage of the laydown area.

The boreholes were terminated at 12.6 m depth (Elevations 93.9 to 96.0).

The approximate locations of the boreholes are shown on the Borehole Location Plan and Soil Strata drawing in Appendix A. The Record of Borehole sheets of the investigation are provided in Appendix B.

Thurber obtained the co-ordinates of the as-drilled borehole locations in the field using a Trimble R10 GPS survey equipment and forwarded them to Egis, who then provided the ground surface elevations. It is understood that the horizontal and vertical accuracy of the survey results meet the MTO terms of reference requirements. The coordinates and elevations of the boreholes are given on the drawing and Record of Borehole sheets in Appendices A and B, respectively.

Traffic control was implemented during loading and unloading operations of the drilling equipment while entering and leaving the site. Prior to commencement of drilling, utility clearances were obtained for all borehole locations.

The boreholes were advanced using a truck-mounted drill rig using solid stem augers. Soil samples were obtained at selected depth intervals using a 50 mm outside diameter split-spoon sampler driven in conjunction with the Standard Penetration Test (SPT) which was performed in accordance with ASTM D1586.

The field investigation was observed on a full-time basis by a member of Thurber's technical staff who marked/staked the boreholes in the field, directed the drilling, sampling and in-situ testing operations, logged the boreholes and processed the recovered soil samples for transport to Thurber's laboratory for further examination and testing.

Groundwater conditions in the open boreholes were observed throughout the drilling operations. Two monitoring well (50 mm diameter Schedule 40 PVC) were installed and enclosed in filter sand in Boreholes 24-01 and 24-03 to permit groundwater level monitoring. Details of the monitoring well installations are shown in Table 3.1.

Table 3.1: Borehole Completion Details

Borehole	Borehole Depth / Base Elevation (m)	Monitoring Well Tip Depth / Elevation (m)	Completion Details
24-01	12.6 / 94.3	9.1 / 97.8	Borehole caved to 10.4 m. Monitoring well with 3.0 m slotted screen installed within sand filter from 10.4 m to 5.5 m, then backfilled with bentonite holeplug from 5.5 m to 0.3 m, sand from 0.3 m to 0.15 m, and cement from 0.15 m to ground surface.
24-03	12.6 / 95.0	12.2 / 95.4	Monitoring well with 3.0 m slotted screen installed within sand filter from 12.6 m to 8.5 m, then backfilled with bentonite holeplug from 8.5 m to 0.3 m, sand from 0.3 m to 0.15 m, and cement from 0.15 m to ground surface.

All boreholes without monitoring well installations were backfilled upon completion of drilling in general accordance with O.Reg. 903. Once the final readings are taken, the monitoring wells will be decommissioned in general accordance with O.Reg. 903.

4. LABORATORY TESTING

The recovered soil samples were subjected to visual identification (VI) and natural moisture content determination. Selected soil samples were subjected to grain size distribution analyses (sieve and/or hydrometer), and Atterberg Limits testing. Geotechnical laboratory testing results of

the current investigation are summarized on the Record of Borehole sheets in Appendix B and are presented on the figures in Appendix C.

5. DESCRIPTION OF SUBSURFACE CONDITIONS

Details of the encountered subsurface stratigraphy from the investigation are presented on the Record of Borehole sheets included in Appendix B, and on the Borehole Locations and Soil Strata drawing in Appendix A. An overall description of the stratigraphy is given in the following paragraphs. However, the factual data presented in the Record of Borehole Sheets governs any interpretation of the site conditions. It must be recognized and anticipated that soil conditions may vary between and beyond the borehole locations.

In general, the subsurface stratigraphy encountered at the site consists of topsoil overlying surficial very loose to compact sand and silt fill. Below the cohesionless fill, native stiff to hard clayey silt till underlain by compact to very dense sand and silt till were encountered. Occasional firm zones of silty clay were contacted within the glacial tills. Groundwater levels measured in two monitoring wells were at 1.3 m and 3.8 m depths below ground surface.

More detailed descriptions of the individual stratum are presented below.

5.1 Topsoil

Topsoil was encountered surficially in all the boreholes drilled at this site. The thickness of the topsoil was 200 mm at all four locations.

The topsoil thickness may vary between and beyond the borehole locations, and the data is not intended for the purpose of estimating quantities.

5.2 Fill

Fill consisting of brown sand and silt containing trace to some gravel and trace to some clay was contacted below the topsoil in Boreholes 24-01, 24-03 and 24-04. The fill thickness varied from 1.2 m to 1.6 m.

The depth to the base of the fill ranged from 1.4 m to 1.8 m (Elevations 105.5 to 106.8).

SPT ‘N’ value recorded in the sand and silt fill ranged from 3 to 26 blows per 0.3 m penetration indicating a very loose to compact state. The natural moisture content measured in samples of the cohesionless fill varied from 4 percent to 23 percent.

The results of grain size distribution analyses carried out on one sample of the sand and silt fill are shown on Figure C1 in Appendix C. The results are summarized as follows:

Soil Particle	Sand and Silt Fill (Percent)
Gravel	1
Sand	50
Silt	38
Clay	11

5.3 Clayey Silt Till

Layers of native brown to grey clayey silt till with sand and containing trace gravel and occasional cobbles was encountered below the fill and topsoil in Boreholes 24-02, 24-03 and 24-04, and below the sand and silt till in Borehole 24-01. Where fully penetrated, the thickness of the clayey silt till varied from 2.7 m to 5.7 m.

The depth to the base of the clayey silt till varied from 2.9 m to 12.4 m (Elevations 94.9 to 103.6). Borehole 24-02 was terminated within the clayey silt till at 12.6 m (Elevation 93.9).

SPT 'N' values measured in the cohesive till typically increased with depth from 8 to 59 blows per 0.3 m penetration, to greater than 50 blows for less than 0.3 m of penetration, indicating a stiff to hard consistency. Some of the higher "N" values may be attributed to the presence of cobbles. An SPT 'N' of 4 blows per 0.3 m of penetration was measured in Borehole 24-01 near Elevation 96, indicating a soft zone. Moisture contents measured in the cohesive till ranged approximately from 6 percent to 23 percent.

The results of grain size distribution analyses carried out on selected samples of the clayey silt till are presented on the Record of Borehole sheets included in Appendix B. Grain size distribution curves of samples tested are presented on Figure C2 in Appendix C. The results of the grain size distribution analyses are summarized below:

Soil Particle	Clayey Silt Till (Percent)
Gravel	3 to 11
Sand	36 to 45
Silt	36 to 44
Clay	12 to 17

The results of Atterberg Limits tests conducted on samples of the clayey silt till are presented on the Record of Borehole sheets in Appendix B and illustrated in Figure C5 of Appendix C. The results are summarized as follows:

Index Property	Percentage (%)
Liquid Limit	16 to 17
Plasticity Index	5 to 6

The results of the Atterberg Limits testing indicate that the clayey silt till is of slight plasticity with a group symbol of CL-ML.

Practical refusal to split spoon sampler advance was noted in the cohesive till in Boreholes 24-03 and 24-04. These occurrences are indication of possible obstructions such as cobbles or boulders.

Glacial tills inherently contain cobbles and boulders.

5.4 Sand and Silt Till

A deposit of brown to grey sand and silt till containing trace to some gravel, trace to some clay and occasional cobbles was encountered below the fill in Borehole 24-01, and below the clayey silt till in Boreholes 24-02, 24-03 and 24-04. Where fully penetrated, the thickness of the sand and silt till varied from 3.0 m to 4.2 m in Boreholes 24-01, 24-02 and 24-04.

The depths to the base of the upper sand and silt till ranged from 5.6 m to 10 m (Elevations 98.6 to 101.3) in Boreholes 24-01, 24-02 and 24-04. Boreholes 24-01, 24-03 and 24-04 were terminated within the lower sand and silt till at 12.6 m depth (Elevations 94.3 to 96.0).

The SPT 'N' values recorded in the cohesionless till ranged from 17 to 95 blows per 0.3 m of penetration, and greater than 50 blows for less than 0.3 m of penetration, indicating a compact to very dense state. Some of the higher "N" values may be attributed to the presence of cobbles. The natural moisture contents measured on samples of the cohesionless till ranged from 6 percent to 10 percent.

The results of grain size distribution analyses carried out on selected samples of the sand and silt till are shown on Figure C3 in Appendix C. The results are summarized as follows:

Soil Particle	Sand and Silt Till (Percent)
Gravel	0 to 7
Sand	43 to 50
Silt	37 to 49
Clay	6 to 12

The results of Atterberg Limits tests conducted on one sample of the sand and silt till are

presented on the Record of Borehole sheets in Appendix B and illustrated in Figure C6 of Appendix C. The results are summarized as follows:

Index Property	Percentage (%)
Liquid Limit	14
Plasticity Index	4

The results of the Atterberg Limits testing indicate that the sand and silt till is considered non-plastic with a group symbol of ML.

Augers grinding and/or split spoon sampler refusal were noted in the cohesionless till in Boreholes 24-02 and 24-03. These occurrences are indication of possible obstructions such as cobbles or boulders.

Glacial tills inherently contain cobbles and boulders.

5.5 Silty Clay

A layer of grey silty clay containing some sand and trace gravel was contacted below the clayey silt till, at 8.6 m depth, in Borehole 24-01 and below the sand and silt till, at 7.1 m depth, in Borehole 24-02. The thickness of the silty clay was 1.4 m and 1.5 m.

The depth to the base of the silty clay was at 10.0 m and 8.6 m (Elevations 96.9 and 97.9) in Boreholes 24-01 and 24-02, respectively.

An SPT 'N' value of 5 blows per 0.3 m of penetration, indicating a firm consistency, was measured in Borehole 24-01. A field vane shear test carried out in this silty clay indicates an undrained shear strength of about 32 kPa. An SPT 'N' value of 50 blows per 0.3 m of penetration, indicating a hard consistency, was measured in Borehole 24-02. Moisture contents measured in the silty clay were 16 percent and 23 percent.

The results of grain size distribution analyses carried out on one sample of the silty clay are presented on the Record of Borehole sheets included in Appendix B. The grain size distribution curve of a sample tested is presented on Figure C4 in Appendix C. The results of the grain size distribution analyses are summarized below:

Soil Particle	Silty Clay (Percent)
Gravel	0
Sand	17
Silt	38
Clay	45

The results of Atterberg Limits test conducted on one sample of the silty clay are presented on the Record of Borehole sheets in Appendix B and illustrated in Figure C7 of Appendix C. The results are summarized as follows:

Index Property	Percentage (%)
Liquid Limit	31
Plasticity Index	17

The results of the Atterberg Limits testing indicate that the silty clay is of low plasticity with a group symbol of CL.

5.6 Groundwater Conditions

Groundwater levels in the boreholes were observed during the drilling operations and measured upon completion of drilling. Monitoring wells were installed in Boreholes 24-01 and 24-03 to permit monitoring of groundwater levels.

Water levels measured in the monitoring wells and open boreholes are presented in Table 5.1 below.

Table 5.1: Groundwater Level Measurements

Borehole	Date	Groundwater Level		Comments
		Depth (m)	Elevation (m)	
24-01	October 24, 2024 November 20, 2024	6.7 1.3	100.2 105.6	Open borehole upon completion Monitoring well
24-02	October 24, 2024	4.6	101.9	Open borehole upon completion
24-03	October 25, 2024 November 20, 2024	11.9 3.8	95.7 103.8	Open borehole upon completion Monitoring well
24-04	October 25, 2024	8.5	100.1	Open borehole upon completion

The groundwater levels measured in the two monitoring wells in Table 5.1 are short term readings where seasonal fluctuations are to be expected. In particular, the groundwater levels may be at a higher elevation after periods of significant or prolonged precipitation. Seasonal fluctuations of the groundwater levels are to be expected.

6. MISCELLANEOUS

Thurber staked and/or marked the borehole locations in the field and obtained utility clearances prior to drilling. Thurber surveyed the as-drilled boreholes in the field and forwarded the borehole coordinates to Egis who provided the ground surface elevations.

Young's Drilling of Bowmanville, Ontario supplied and operated the drilling and sampling equipment for the field program.

Full time supervision of the field activities was carried out by Mr. Charles Jin of Thurber. Overall supervision of the field program was performed by Mr. Rod de Castro, P.Eng. of Thurber.

Interpretation of the field data and preparation of the report was carried out by Ms. Rocio Reyna, P.Eng. This report was reviewed by Messrs. Sydney Pang, P.Eng. and P.K. Chatterji, P.Eng., a Designated Principal Contact for MTO Foundations Projects.

Thurber Engineering Ltd.

Rocio Palomeque Reyna, P. Eng.
Associate, Senior Geotechnical Engineer

Sydney Pang, P. Eng.
Senior Associate, Senior Foundation Engineer

Date: ***March 12, 2025***
File: ***30915***

P.K. Chatterji, P. Eng.
Review Principal, Designated MTO Contact

THURBER

STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

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5. INTERPRETATION OF THE REPORT

a) Nature and Exactness of Soil and Contaminant Description: Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors are judgmental in nature. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other persons making use of such documents or records with our express written consent should be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) Reliance on Provided Information: The evaluation and conclusions contained in the Report have been prepared on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

c) Design Services: The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber should be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design detailed in the contract documents should be reported to Thurber immediately so that Thurber can address potential conflicts.

d) Construction Services: During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions in order to confirm and document that the site conditions do not materially differ from those interpreted conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

7. INDEPENDENT JUDGEMENTS OF CLIENT

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or others who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes but is not limited to decisions made to develop, purchase or sell land.

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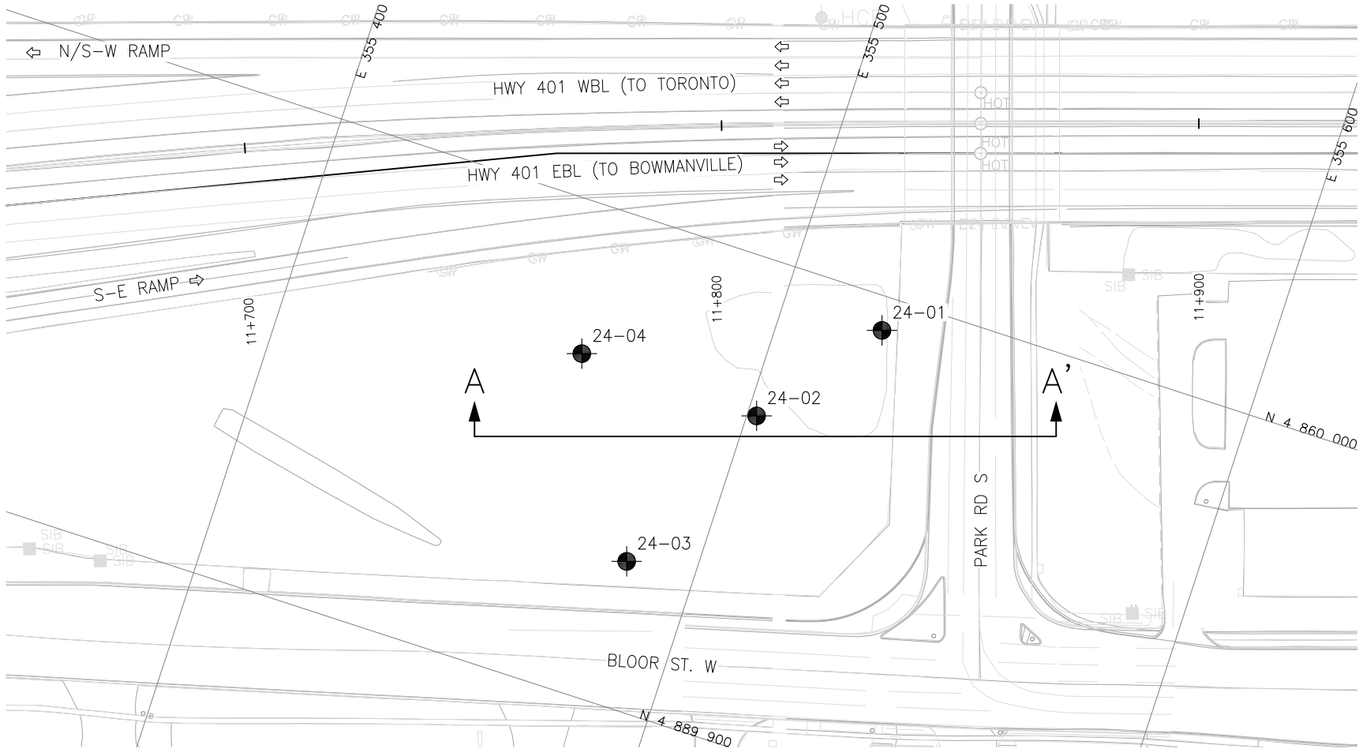
APPENDIX A

Drawing 1 - Borehole Locations Plan and Soil Strata

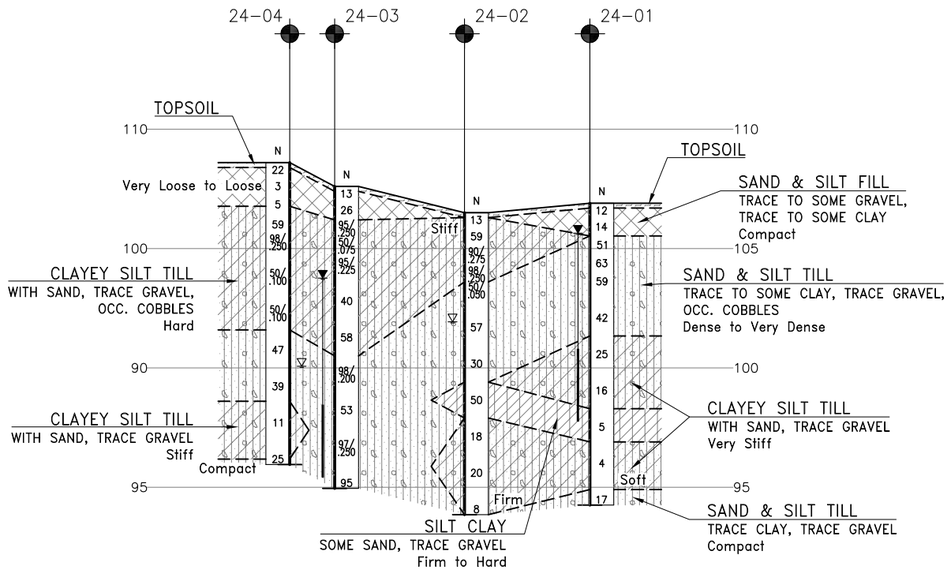
MINISTRY OF TRANSPORTATION, ONTARIO



PLAN

25 0 25 50m

SCALE 1:1250



SECTION ALONG A–A'

25 0 25 50m H 1:1250

5 0 5 10m V 1:250

METRIC

DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN

LICENSED PROFESSIONAL ENGINEER
S. PANG
35314509
2025/03/12
PROVINCE OF ONTARIO

LICENSED PROFESSIONAL ENGINEER
P. K. CHATTERJI
2025/03/12
PROVINCE OF ONTARIO

CONT No
WP No 2555-17-00

SHEET

HIGHWAY 401
PARK ROAD SOUTH
LAYDOWN AREA
BOREHOLE LOCATIONS AND SOIL STRATA

egis

THURBER

KEYPLAN

LEGEND

●	Borehole
⊕	Borehole and Cone
N	Blows /0.3m (Std Pen Test, 475J/blow)
CONE	Blows /0.3m (60° Cone, 475J/blow)
PH	Pressure, Hydraulic
▽	Water Level Upon Completion of Drilling
▼	Water Level in Monitoring Well/Piezometer
	Monitoring Well/Piezometer Screen
90%	Rock Quality Designation (RQD)
A/R	Auger Refusal

NO	ELEVATION	NORTHING	EASTING
24-01	106.9	4 859 993.0	355 521.4
24-02	106.5	4 859 967.8	355 502.0
24-03	107.6	4 859 930.4	355 485.5
24-04	108.6	4 859 968.9	355 463.1

-NOTES-

1) The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.
2) This drawing is for subsurface information only. Surface details and features are for conceptual illustration.
3) Coordinate system is MTM NAD 83 Zone 10.

GEOCRES No. 30M15-370

REVISIONS		
DATE	BY	DESCRIPTION

DESIGN	RPR	CHK	SKP	CODE	LOAD	DATE	MAR 2025
DRAWN	AN	CHK	RPR	SITE	STRUCT	DWG	1

FILENAME: H:\Drafting\30000\30915\TED-30915-PLPR-LD.dwg
PLOTDATE: 3/12/2025 11:12 AM

APPENDIX B

Record of Borehole Sheets

SYMBOLS, ABBREVIATIONS AND TERMS USED ON RECORDS OF BOREHOLES

1. TEXTURAL CLASSIFICATION OF SOILS

CLASSIFICATION	PARTICLE SIZE	VISUAL IDENTIFICATION
Boulders	Greater than 200mm	same
Cobbles	75 to 200mm	same
Gravel	4.75 to 75mm	5 to 75mm
Sand	0.075 to 4.75mm	Not visible particles to 5mm
Silt	0.002 to 0.075mm	Non-plastic particles, not visible to the naked eye
Clay	Less than 0.002mm	Plastic particles, not visible to the naked eye

2. COARSE GRAIN SOIL DESCRIPTION (50% greater than 0.075mm)

TERMINOLOGY	PROPORTION
Trace or Occasional	Less than 10%
Some	10 to 20%
Adjective (e.g. silty or sandy)	20 to 35%
And (e.g. sand and gravel)	35 to 50%

3. TERMS DESCRIBING CONSISTENCY (COHESIVE SOILS ONLY)

DESCRIPTIVE TERM	UNDRAINED SHEAR STRENGTH (kPa)	APPROXIMATE SPT[(1)] 'N' VALUE
Very Soft	12 or less	Less than 2
Soft	12 to 25	2 to 4
Firm	25 to 50	4 to 8
Stiff	50 to 100	8 to 15
Very Stiff	100 to 200	15 to 30
Hard	Greater than 200	Greater than 30

NOTE: Hierarchy of Soil Strength Prediction

1) Laboratory Triaxial Testing
2) Field Insitu Vane Testing
3) Laboratory Vane Testing
4) SPT value
5) Pocket Penetrometer

4. TERMS DESCRIBING DENSITY (COHESIONLESS SOILS ONLY)

DESCRIPTIVE TERM	SPT "N" VALUE
Very Loose	Less than 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very Dense	Greater than 50

5. LEGEND FOR RECORDS OF BOREHOLES

SYMBOLS AND ABBREVIATIONS FOR SAMPLE TYPE	SS Split Spoon Sample	WS Wash Sample	AS Auger (Grab) Sample
	TW Thin Wall Shelby Tube Sample		TP Thin Wall Piston Sample
	PH Sampler Advanced by Hydraulic Pressure		PM Sampler Advanced by Manual Pressure
	WH Sampler Advanced by Self Static Weight	RC Rock Core	SC Soil Core

$$\text{Sensitivity} = \frac{\text{Undisturbed Shear Strength}}{\text{Remoulded Shear Strength}}$$

▼ Water Level

C_{pen} Shear Strength Determination by Pocket Penetrometer

(1) SPT 'N' Value Standard Penetration Test 'N' Value – refers to the number of blows from a 63.5kg hammer free falling a height of 0.76m to advance a standard 50 mm outside diameter split spoon sampler for 0.3 m depth into undisturbed ground.

(2) DCPT Dynamic Cone Penetration Test – Continuous penetration of a 50 mm outside diameter, 60° conical steel point attached to "A" size rods driven by a 63.5 kg hammer free falling a height of 0.76 m. The resistance to cone penetration is the number of hammer blows required for each 0.3 m advance of the conical point into undisturbed ground.

UNIFIED SOILS CLASSIFICATION

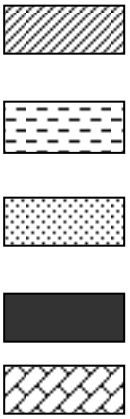
MAJOR DIVISIONS		GROUP SYMBOL	TYPICAL DESCRIPTION
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravels or gravel-sand mixtures, little or no fines.
		GP	Poorly-graded gravels or gravel-sand mixtures, little or no fines.
		GM	Silty gravels, gravel-sand-silt mixtures.
		GC	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS	SW	Well-graded sands or gravelly sands, little or no fines.
		SP	Poorly-graded sands or gravelly sands, little or no fines.
		SM	Silty sands, sand-silt mixtures.
		SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS	SILTS AND CLAYS $W_L < 50\%$	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. ($W_L < 30\%$).
		CI	Inorganic clays of medium plasticity, silty clays. ($30\% < W_L < 50\%$).
		OL	Organic silts and organic silty-clays of low plasticity.
	SILTS AND CLAYS $W_L > 50\%$	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Inorganic clays of high plasticity, fat clays.
		OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils.
CLAY SHALE			
SANDSTONE			
SILTSTONE			
CLAYSTONE			
COAL			

EXPLANATION OF ROCK LOGGING TERMS

ROCK WEATHERING CLASSIFICATION

Fresh (FR)	No visible signs of weathering.
Fresh Jointed (FJ)	Weathering limited to the surface of major discontinuities.
Slightly Weathered (SW)	Penetrative weathering developed on open discontinuity surfaces, but only slight weathering of rock material.
Moderately Weathered (MW)	Weathering extends throughout the rock mass, but the rock material is not friable.
Highly Weathered (HW)	Weathering extends throughout the rock mass and the rock is partly friable.
Completely Weathered (CW)	Rock is wholly decomposed and in a friable condition, but the rock texture and structure are preserved.

SYMBOLS



CLAYSTONE

SILTSTONE

SANDSTONE

COAL

Bedrock (general)

DISCONTINUITY SPACING

Bedding	Bedding Plane Spacing
Very thickly bedded	Greater than 2m
Thickly bedded	0.6 to 2m
Medium bedded	0.2 to 0.6m
Thinly bedded	60mm to 0.2m
Very thinly bedded	20 to 60mm
Laminated	6 to 20mm
Thinly Laminated	Less than 6mm

TERMS

Total Core Recovery: (TCR)	Core recovered as a percentage of total core run length.
Solid Core Recovery: (SCR)	Percent Ratio of solid core of full cylindrical shape recovered. Expressed with respect to the total length of core run.
Rock Quality Designation: (RQD)	Total length of sound core recovered in pieces 0.1m in length or larger as a percentage of total core run length.
Uniaxial Compressive Strength (UCS)	Axial stress required to break the specimen
Fracture Index: (FI)	Frequency of natural fractures per 0.3m of core run.

STRENGTH CLASSIFICATION

Rock Strength	Approximate Uniaxial Compressive Strength (MPa)	(psi)	Field Estimation of Hardness*
Extremely Strong	Greater than 250	Greater than 36,000	Specimen can only be chipped with a geological hammer
Very Strong	100-250	15,000 to 36,000	Requires many blows of geological hammer to break
Strong	50-100	7,500 to 15,000	Requires more than one blow of geological hammer to break
Medium Strong	25.0 to 50.0	3,500 to 7,500	Breaks under single blow of geological hammer.
Weak	5.0 to 25.0	750 to 3,500	Can be peeled by a pocket knife with difficulty
Very Weak	1.0 to 5.0	150 to 750	Can be peeled by a pocket knife, crumbles under firm blows of geological pick.
Extremely Weak (Rock)	0.25 to 1.0	35 to 150	Indented by thumbnail

THURBER

Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 24-01 1 OF 2 METRIC

WP# 2555-17-00 LOCATION Laydown Area; MTM83-10: N 4 859 993.0 E 355 521.4 ORIGINATED BY CJ

DIST HWY 401 BOREHOLE TYPE Solid Stem Augers COMPILED BY AN

DATUM Geodetic DATE 2024.10.24 - 2024.10.24 LATITUDE 43.878167 LONGITUDE -78.868840 CHECKED BY RPR

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
106.9	GROUND SURFACE										
0.0	**TOPSOIL:** (200mm)										
0.2	**SAND** and **SILT**, some clay, trace gravel Compact Brown Moist (FILL)		1	SS	12						
			2	SS	14		106				1 50 38 11
105.5											
1.4	**SAND** and **SILT**, trace to some clay, trace gravel Very Dense Brown Moist (TILL)		3	SS	51		105				
			4	SS	63						
			5	SS	59		104				
	Dense Grey Wet		6	SS	42		103				0 50 38 12
101.3							102				
5.6	Clayey **SILT**, with sand, trace gravel Very Stiff Grey Wet (TILL)		7	SS	25		101				
			8	SS	16		100				
98.3							99				
8.6	Silty **CLAY**, some sand Firm Grey Wet (CL)		9	SS	5		98	2.0			0 17 38 45
96.9							97				

Continued Next Page

$+^3$, $\times^3$: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

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Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 24-01 2 OF 2 METRIC

WP# 2555-17-00 LOCATION Laydown Area; MTM83-10: N 4 859 993.0 E 355 521.4 ORIGINATED BY CJ

DIST HWY 401 BOREHOLE TYPE Solid Stem Augers COMPILED BY AN

DATUM Geodetic DATE 2024.10.24 - 2024.10.24 LATITUDE 43.878167 LONGITUDE -78.868840 CHECKED BY RPR

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued From Previous Page										
10.0	Clayey **SILT**, with sand, trace gravel Soft Grey Wet (TILL)		10	SS	4		96		○		
94.9							95				
12.0	**SAND** and **SILT**, trace gravel, trace clay Compact Grey Wet (TILL)		11	SS	17				○ ○		
94.3											
12.6	END OF BOREHOLE AT 12.6m. BOREHOLE CAVED TO A 10.4m. WATER LEVEL AT 6.7m UPON COMPLETION. Well installation consists of 50mm diameter Schedule 40 PVC pipe with a 3.05m slotted screen. WATER LEVEL READINGS DATE DEPTH(m) ELEV.(m) 2024.11.20 1.3 105.6										

$+^3$, $\times^3$: Numbers refer to Sensitivity

15 20 5 10 (%) STRAIN AT FAILURE

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Ontario

THURBER

RECORD OF BOREHOLE No 24-02 1 OF 2 METRIC

WP# 2555-17-00 LOCATION Laydown Area; MTM83-10: N 4 859 967.8 E 355 502.0 ORIGINATED BY CJ

DIST HWY 401 BOREHOLE TYPE Solid Stem Augers COMPILED BY AN

DATUM Geodetic DATE 2024.10.24 - 2024.10.24 LATITUDE 43.877942 LONGITUDE -78.869084 CHECKED BY RPR

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
106.5	GROUND SURFACE										
0.0	**TOPSOIL:** (200mm)										
0.2	Clayey **SILT**, with sand, trace gravel Stiff to Hard Grey Wet (TILL)(CL-ML)		1	SS	13		106		○		
			2	SS	59				○		
			3	SS	90/ 0.275		105		○ H		8 40 36 16
			4	SS	98/ 0.250		104		○		
103.6											
2.9	**SAND** and **SILT**, some clay, trace gravel Very Dense Brown Wet (TILL) Augers grinding at 3.0m		5	SS	50/ 0.050		103				
	Grey Wet		6	SS	57	▽	102		○		
	Dense		7	SS	30		101		○		5 46 39 10
99.4							100				
7.1	Silty **CLAY**, some sand, trace gravel Hard Grey Wet		8	SS	50		99		○		
97.9							98				
8.6	Clayey **SILT**, with sand, trace gravel Very Stiff Grey Wet (TILL)		9	SS	18		97		○		

Continued Next Page

$+^3$, $\times^3$: Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 24-02 2 OF 2 METRIC

WP# 2555-17-00 LOCATION Laydown Area; MTM83-10: N 4 859 967.8 E 355 502.0 ORIGINATED BY CJ

DIST HWY 401 BOREHOLE TYPE Solid Stem Augers COMPILED BY AN

DATUM Geodetic DATE 2024.10.24 - 2024.10.24 LATITUDE 43.877942 LONGITUDE -78.869084 CHECKED BY RPR

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
	Continued From Previous Page										
	Clayey **SILT**, with sand, trace gravel Very Stiff Grey Wet (TILL)						96				
			10	SS	20				○		3 45 40 12
							95				
93.9	Firm		11	SS	8		94		○		
12.6	END OF BOREHOLE AT 12.6m. BOREHOLE CAVED TO A 4.9m. WATER LEVEL AT 4.6m UPON COMPLETION. BOREHOLE BACKFILLED WITH BENTONITE HOLEPLUG AND AUGER CUTTINGS TO GROUND SURFACE.										

$+^3$, $\times^3$: Numbers refer to Sensitivity

$\frac{20}{15}\oplus\frac{5}{10}$ (%) STRAIN AT FAILURE

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THURBER

RECORD OF BOREHOLE No 24-03 1 OF 2 METRIC

WP# 2555-17-00 LOCATION Laydown Area; MTM83-10: N 4 859 930.4 E 355 485.5 ORIGINATED BY CJ

DIST HWY 401 BOREHOLE TYPE Solid Stem Augers COMPILED BY AN

DATUM Geodetic DATE 2024.10.25 - 2024.10.25 LATITUDE 43.877606 LONGITUDE -78.869292 CHECKED BY RPR

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
107.6	GROUND SURFACE										
0.0	**TOPSOIL:** (200mm)										
0.2	**SAND** and **SILT**, some gravel, trace clay Compact Brown Moist (FILL)		1	SS	13		107		○		
			2	SS	26				○		
106.2	Occasional black stains										
1.4	Clayey **SILT**, with sand, trace to some gravel Hard Grey Wet (TILL)(CL-ML)		3	SS	95/ 0.250		106		○		
			4	SS	50/ 0.075		105		○H		11 37 38 14
			5	SS	95/ 0.225				○		
							104				
			6	SS	40		103		○		
							102				
	Moist to Wet		7	SS	58				○		
100.5							101				
7.1	**SAND** and **SILT**, trace gravel, trace clay Very Dense Grey Wet (TILL)		8	SS	98/ 0.200		100		○		2 47 41 10
							99				
	Occasional cobbles		9	SS	53				○		
							98				

Continued Next Page

$+^3$, $\times^3$: Numbers refer to Sensitivity

$\frac{20}{15 \oplus 5}$ (%) STRAIN AT FAILURE

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Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 24-03 2 OF 2 METRIC

WP# 2555-17-00 LOCATION Laydown Area; MTM83-10: N 4 859 930.4 E 355 485.5 ORIGINATED BY CJ

DIST HWY 401 BOREHOLE TYPE Solid Stem Augers COMPILED BY AN

DATUM Geodetic DATE 2024.10.25 - 2024.10.25 LATITUDE 43.877606 LONGITUDE -78.869292 CHECKED BY RPR

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (20 40 60 80 100) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued From Previous Page										
	SAND and **SILT**, trace gravel, trace clay Very Dense Grey Wet (TILL)						97				
			10	SS	97/ 0.250				○		2 43 49 6
							96				
95.0			11	SS	95		95		○		
12.6	END OF BOREHOLE AT 12.6m. BOREHOLE OPEN. WATER LEVEL AT 11.9m UPON COMPLETION. Well installation consists of 50mm diameter Schedule 40 PVC pipe with a 3.05m slotted screen. WATER LEVEL READINGS DATE DEPTH(m) ELEV.(m) 2024.11.20 3.8 103.8										

+ ³, × ³: Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

ONTMT4S2 2020LIBRARY(MTO).GLB MTO-30915.GPJ 2/11/25

Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 24-04 1 OF 2 METRIC

WP# 2555-17-00 LOCATION Laydown Area; MTM83-10: N 4 859 968.9 E 355 463.1 ORIGINATED BY CJ

DIST HWY 401 BOREHOLE TYPE Solid Stem Augers COMPILED BY AN

DATUM Geodetic DATE 2024.10.25 - 2024.10.25 LATITUDE 43.877954 LONGITUDE -78.869567 CHECKED BY RPR

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
108.6	GROUND SURFACE										
0.0	**TOPSOIL:** (200mm)										
0.2	**SAND** and **SILT**, some gravel, trace clay Compact Brown Moist (FILL)		1	SS	22		108		○		
	Very Loose to Loose		2	SS	3				○		
	Layer of clayey silt, black (200mm)						107		○		
106.8			3	SS	5				○		
1.8	Clayey **SILT**, with sand, trace gravel Hard Brown to Grey Moist to Wet (TILL)(CL-ML)		4	SS	59		106		○		
			5	SS	98/ 0.250		105		○H		3 36 44 17
	Grey		6	SS	50/ 0.100		104		○		
	Occasional cobbles		7	SS	50/ 0.100		103		○		
101.6							102				
7.0	**SAND** and **SILT**, some clay, trace gravel Dense Grey Wet (TILL)(ML)		8	SS	47	▽	101		○		
	Occasional cobbles Moist to Wet		9	SS	39		100		○H		7 44 37 12
98.6							99				

Continued Next Page

+ ³, × ³: Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

THURBER

RECORD OF BOREHOLE No 24-04 2 OF 2 METRIC

WP# 2555-17-00 LOCATION Laydown Area; MTM83-10: N 4 859 968.9 E 355 463.1 ORIGINATED BY CJ

DIST HWY 401 BOREHOLE TYPE Solid Stem Augers COMPILED BY AN

DATUM Geodetic DATE 2024.10.25 - 2024.10.25 LATITUDE 43.877954 LONGITUDE -78.869567 CHECKED BY RPR

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT γ kN/m^3	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued From Previous Page										
10.0	Clayey **SILT**, with sand, trace gravel Stiff Grey Moist to Wet (TILL)						98				
			10	SS	11						
							97				
96.2	Wet										
12.4 96.0	**SAND** and **SILT**, trace gravel, trace clay Compact Grey Wet (TILL)		11	SS	25		96				
12.6	END OF BOREHOLE AT 12.6m. BOREHOLE OPEN. WATER LEVEL AT 8.5m UPON COMPLETION. BOREHOLE BACKFILLED WITH BENTONITE HOLEPLUG AND AUGER CUTTINGS TO GROUND SURFACE.										

+ ^{3}, × ^{3}: Numbers refer to Sensitivity

(%) STRAIN AT FAILURE

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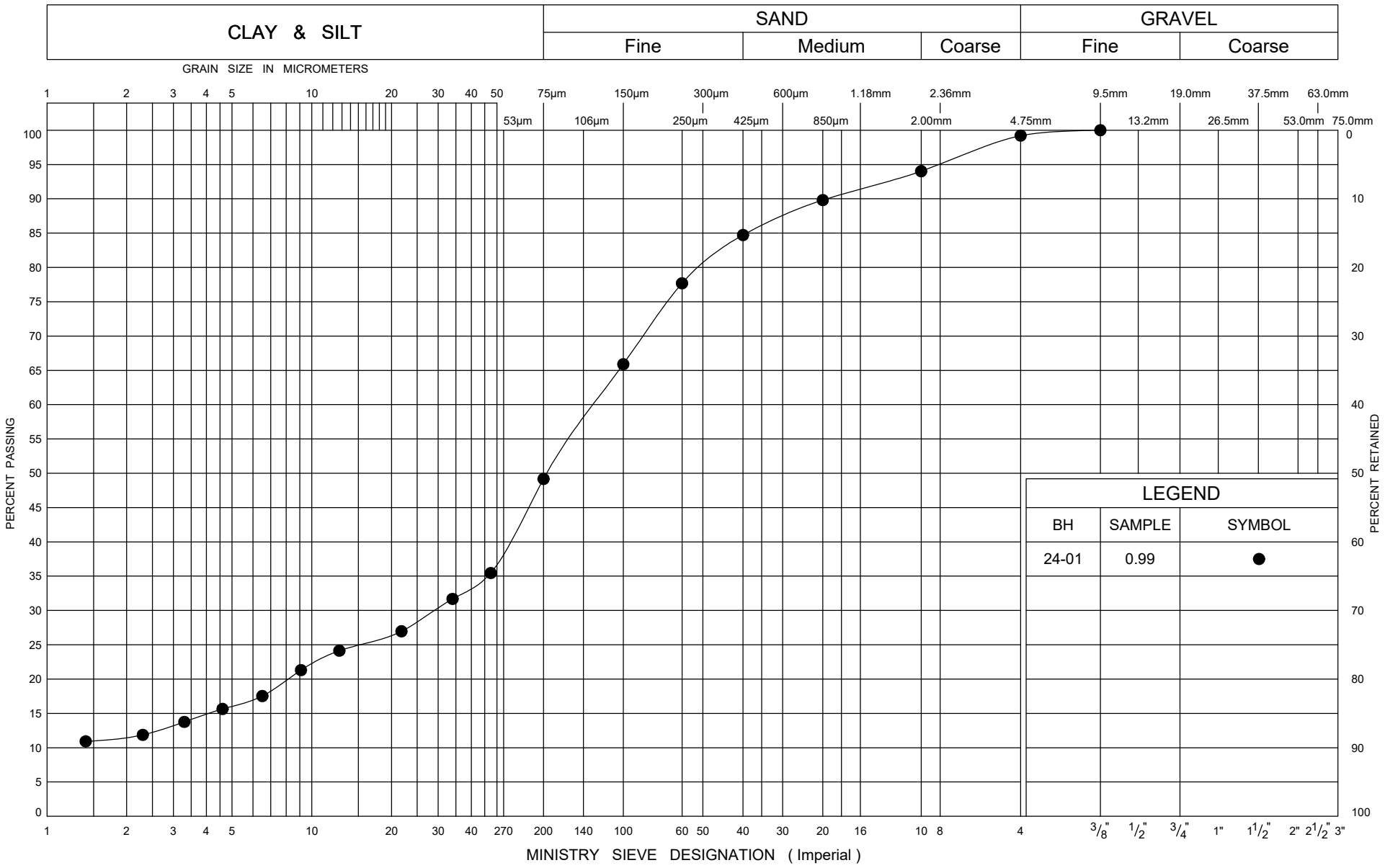
APPENDIX C

Geotechnical Laboratory Test Results



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GRAIN SIZE DISTRIBUTION

SAND and SILT FILL

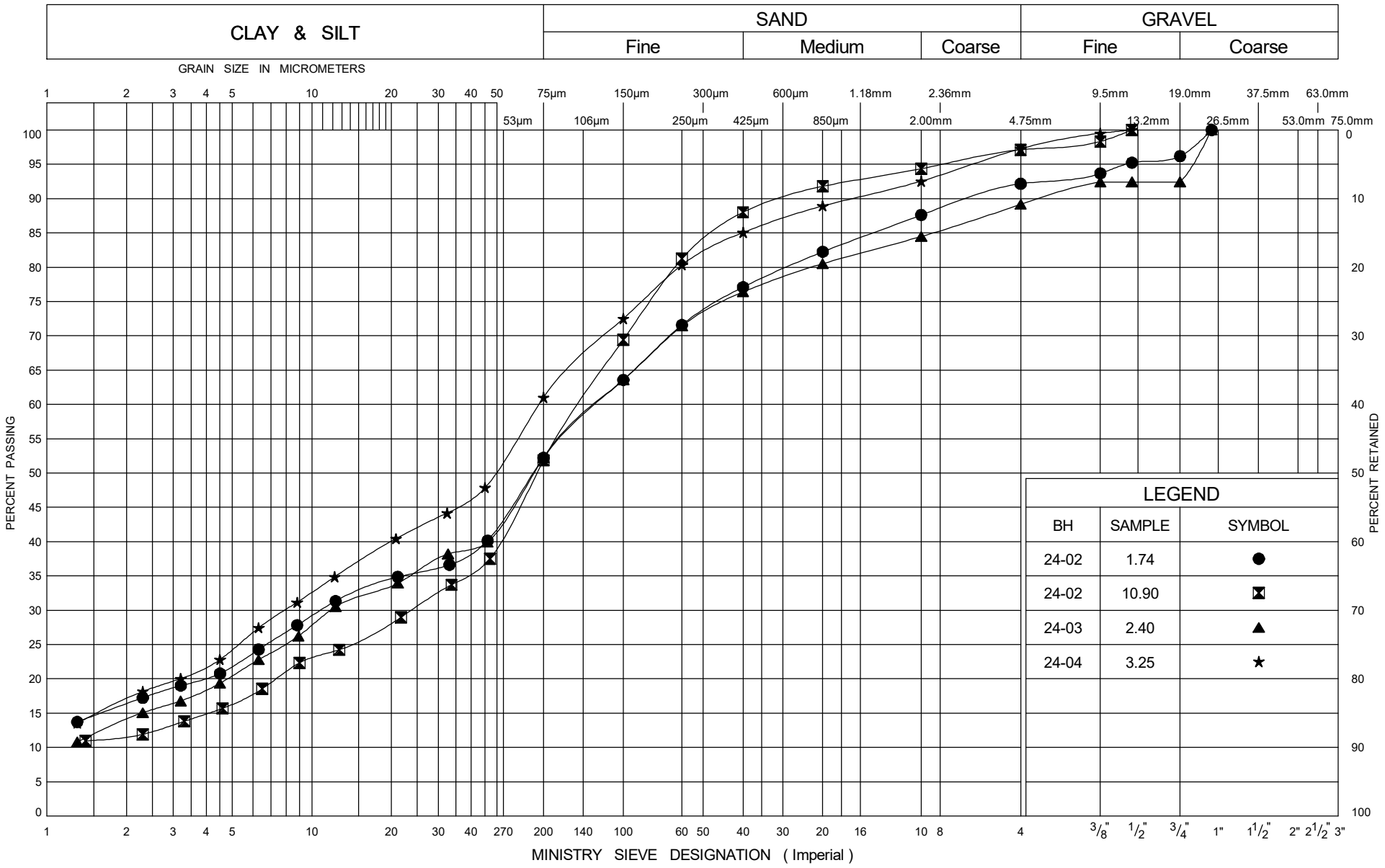
FIG No C1

WP# 2555-17-00

Laydown Area

ONTARIO MOT GRAIN SIZE 2 MTO-30915.GPJ ONTARIO MOT.GDT 12/3/24

UNIFIED SOIL CLASSIFICATION SYSTEM



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GRAIN SIZE DISTRIBUTION

Clayey SILT TILL

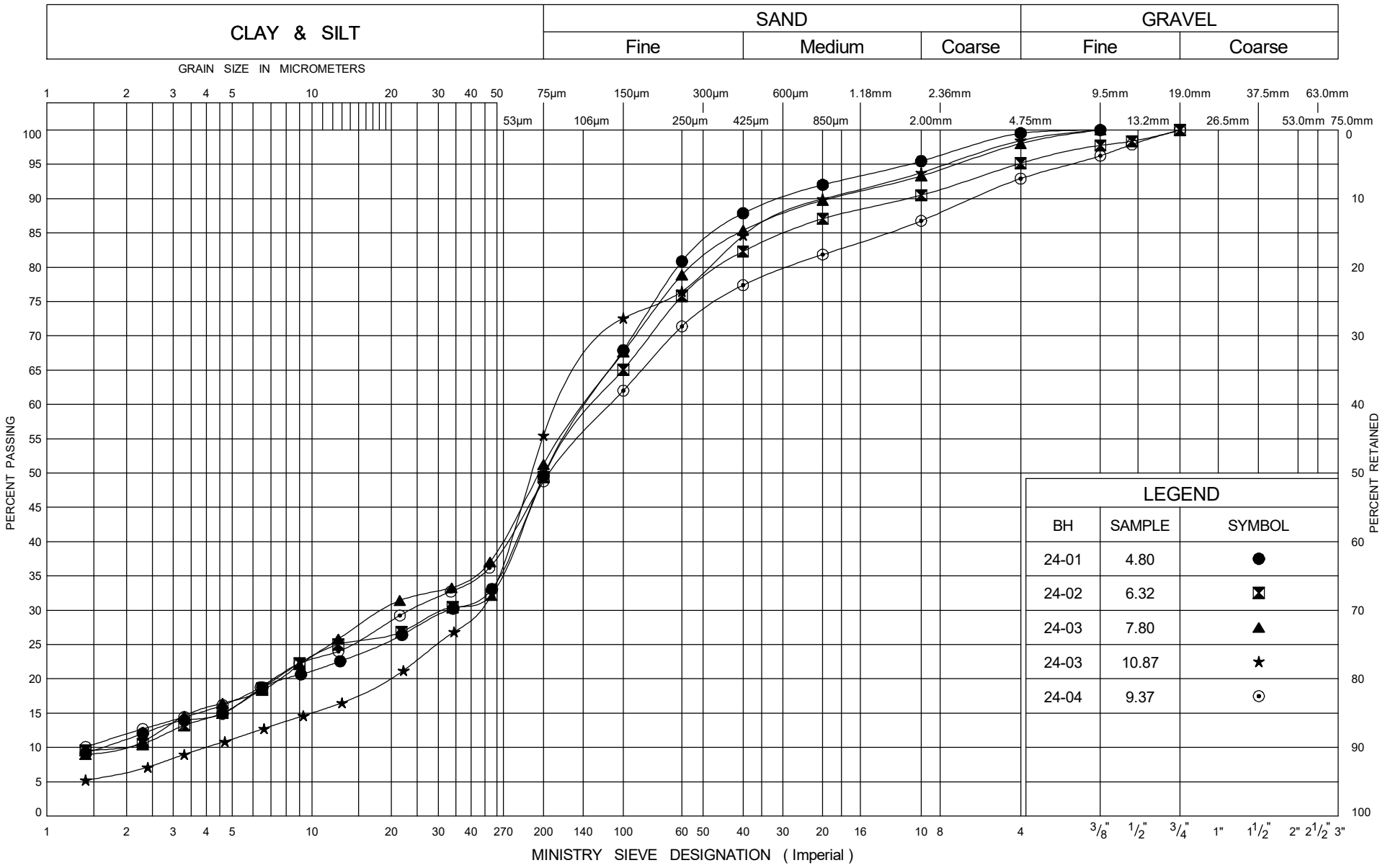
FIG No C2

WP# 2555-17-00

Laydown Area

ONTARIO MOT GRAIN SIZE MTO-30915.GPJ ONTARIO MOT.GDT 1/17/25

UNIFIED SOIL CLASSIFICATION SYSTEM



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GRAIN SIZE DISTRIBUTION

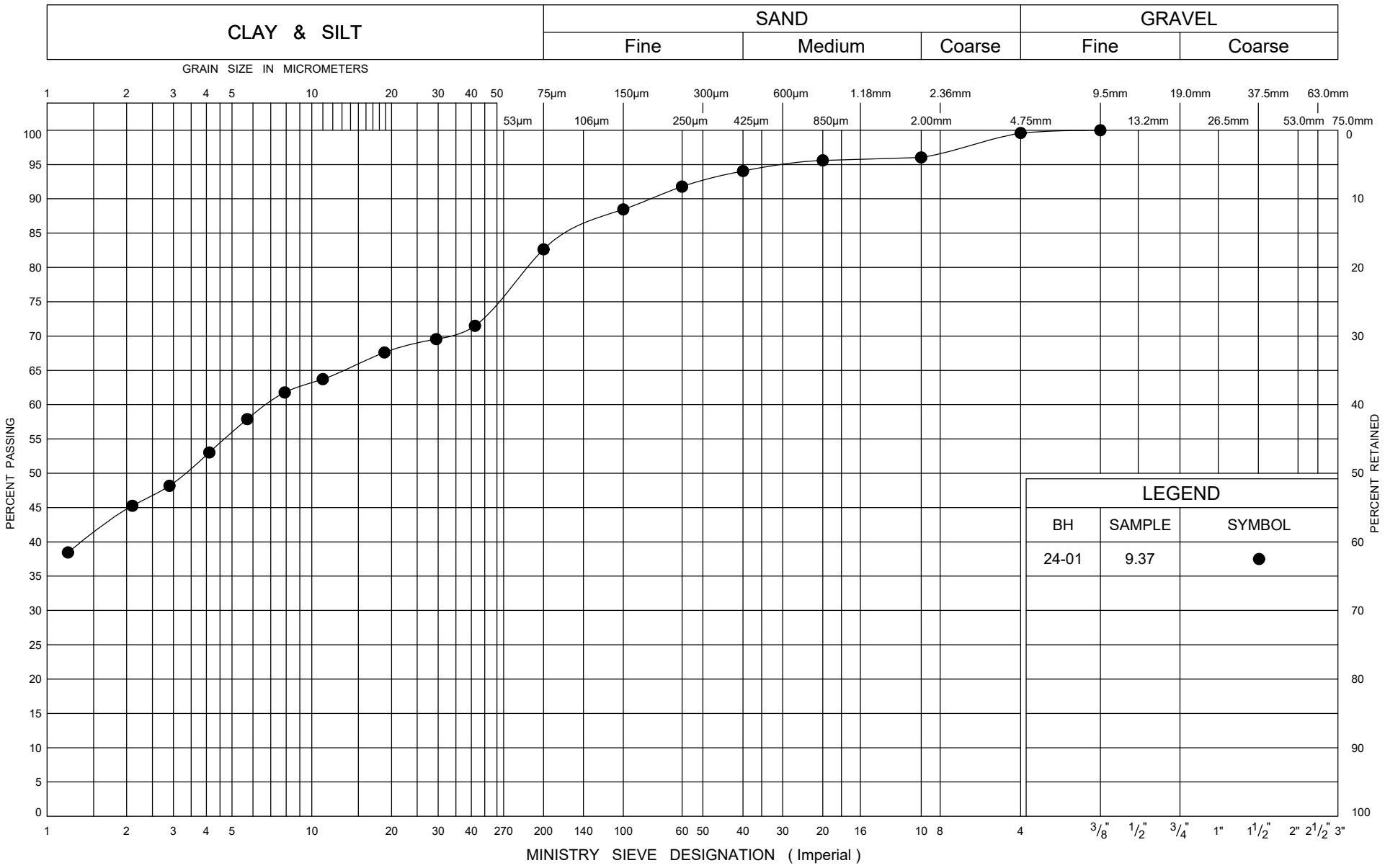
SAND and SILT TILL

FIG No C3

WP# 2555-17-00

Laydown Area

ONTARIO MOT GRAIN SIZE MTO-30915.GPJ ONTARIO MOT.GDT 1/17/25



ONTARIO MOT GRAIN SIZE 2 MTO-30915.GPJ ONTARIO MOT.GDT 12/3/24

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GRAIN SIZE DISTRIBUTION

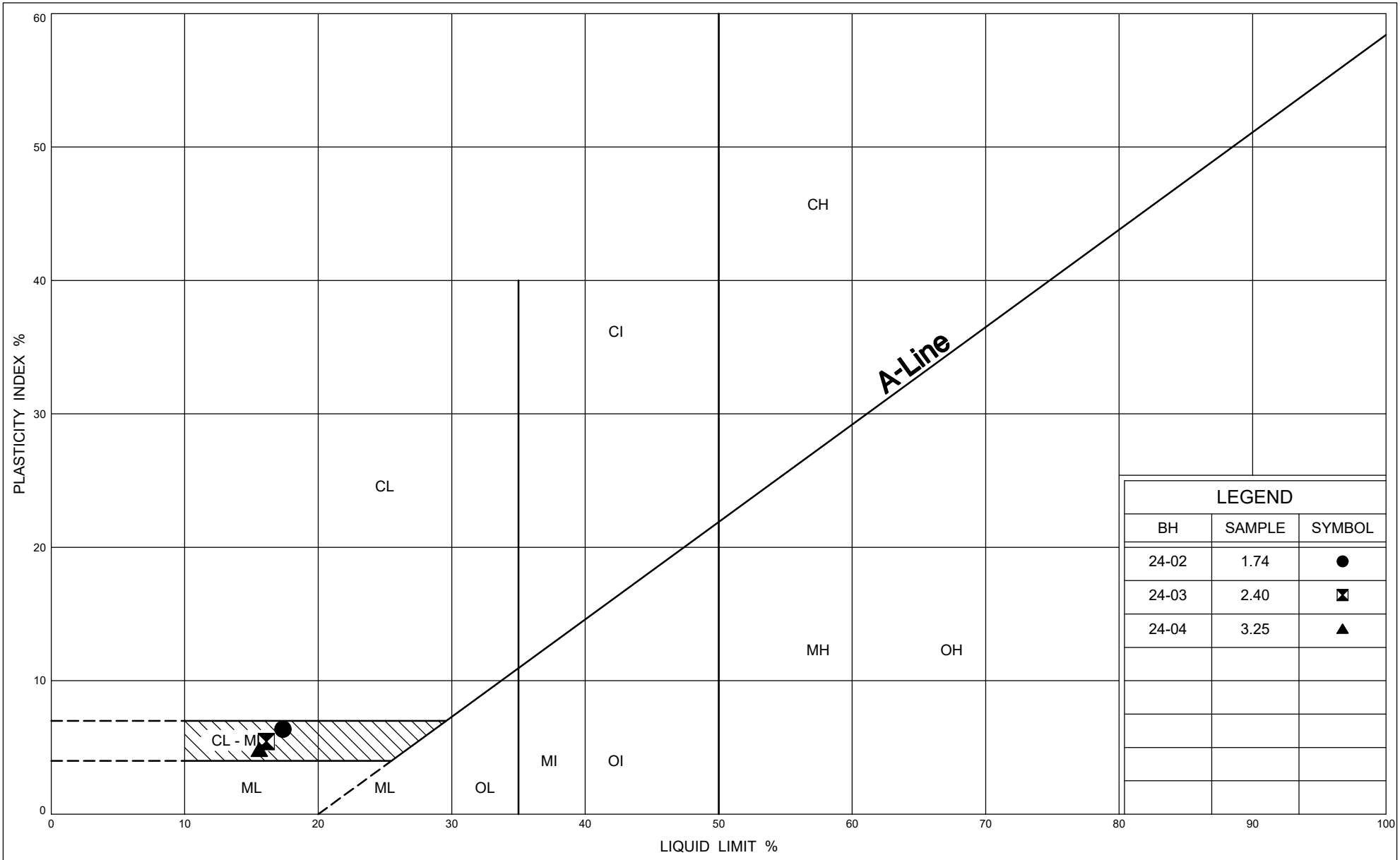
Silty CLAY

FIG No C4

WP# 2555-17-00

Laydown Area

Oct 75, FF - S - 21



ONTARIO MOT PLASTICITY CHART MTO-30915.GPJ ONTARIO MOT.GDT 12/3/24

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PLASTICITY CHART

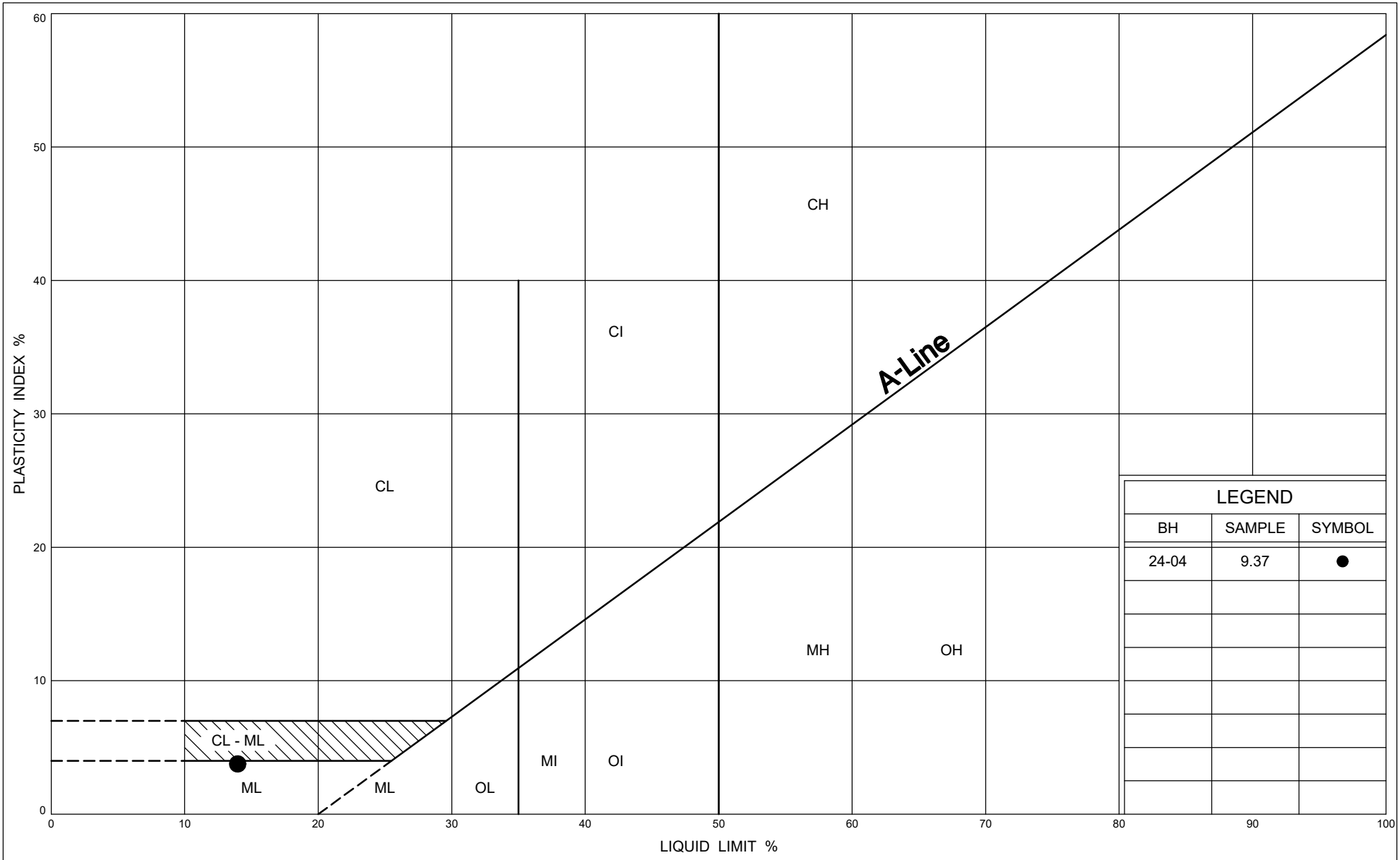
Clayey SILT TILL

FIG No C5

WP# 2555-17-00

Laydown Area

Oct 75, FF - S - 21



ONTARIO MOT PLASTICITY CHART MTO-30915.GPJ ONTARIO MOT.GDT 12/3/24

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PLASTICITY CHART

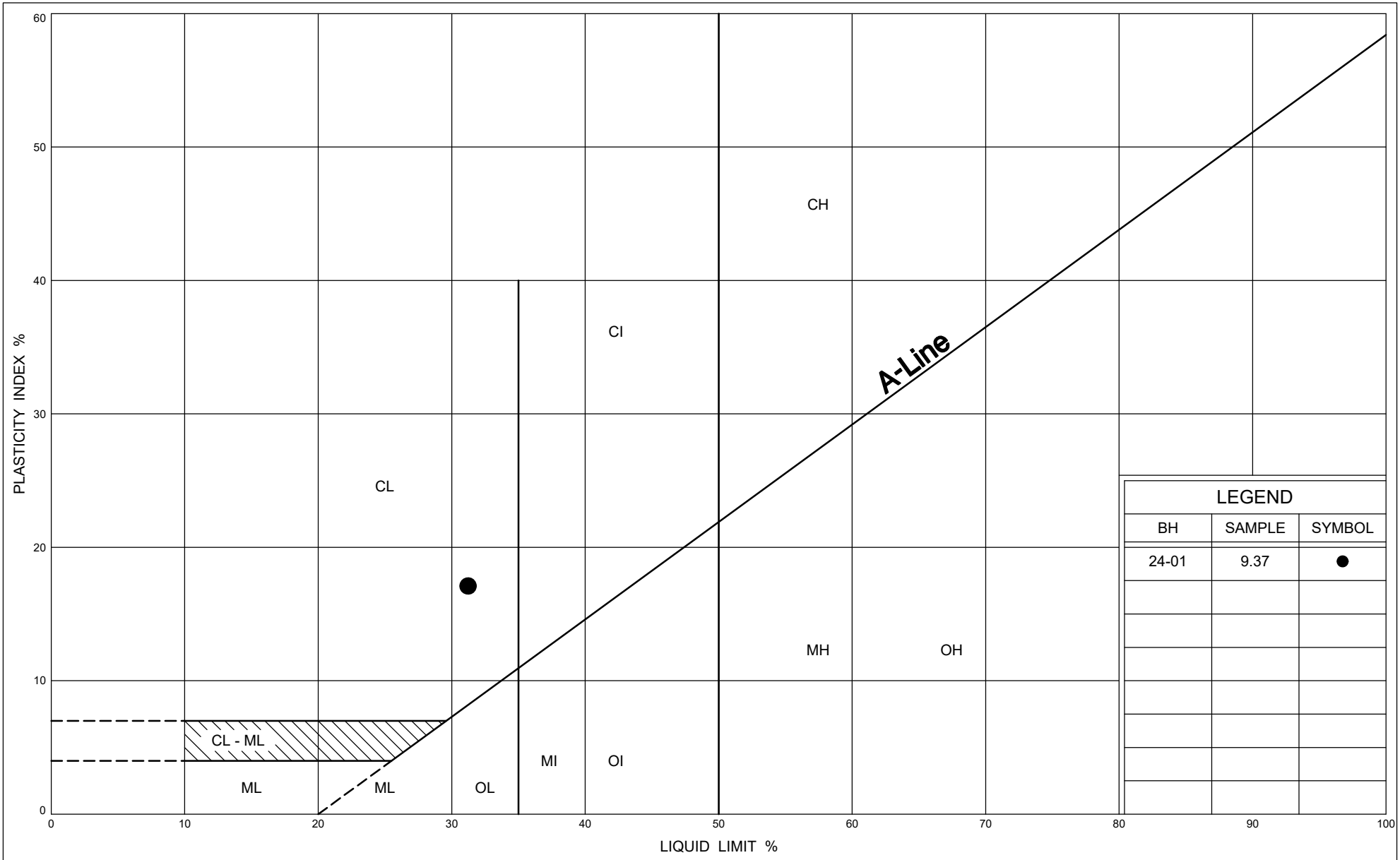
SAND and SILT TILL

FIG No C6

WP# 2555-17-00

Laydown Area

Oct 75, FF - S - 21



ONTARIO MOT PLASTICITY CHART MTO-30915.GPJ ONTARIO MOT.GDT 12/3/24

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PLASTICITY CHART

Silty CLAY

FIG No C7

WP# 2555-17-00

Laydown Area